

**What is claimed is:**

1. A semiconductor device that includes a semiconductor substrate having a via hole that penetrates the semiconductor substrate from a surface to a reverse side,  
5 wherein a part of an electrode formed on the surface of the semiconductor substrate reaches the reverse side of the semiconductor substrate through the via hole, and  
an inside of the via hole is filled in with a photosensitive resin to fully cover an aperture of the via hole on the surface of the  
10 semiconductor substrate.
2. The semiconductor device according to Claim 1,  
wherein the photosensitive resin is filled in more shallowly than depth of the via hole.
- 15 3. The semiconductor device according to Claim 2,  
wherein a main ingredient of the photosensitive resin is silicone resin or epoxy resin.
- 20 4. The semiconductor device according to Claim 3,  
wherein viscosity of the photosensitive resin at 25°C is 70~600 m Pa · s.
5. The semiconductor device according to Claim 1,  
25 wherein the main ingredient of the photosensitive resin is the silicone resin or the epoxy resin.
6. The semiconductor device according to Claim 1,  
wherein viscosity of the photosensitive resin at 25°C is  
30 70~600 m Pa · s.
7. A manufacturing method of a semiconductor including a

semiconductor substrate having a via hole that penetrates the semiconductor substrate from a surface to a reverse side and a substrate for assembly connected to the reverse side of the semiconductor substrate via an adhesive metal, the manufacturing method comprising:

a photosensitive resin filling process of rotating the semiconductor substrate, applying a photosensitive resin to a surface of the semiconductor substrate on which a hole to be a via hole is formed, and filling in an inside of the hole to be the via hole with the photosensitive resin to fully cover an aperture of the hole to be the via hole;

a photosensitive resin flattening process of rotating the semiconductor substrate and flattening the photosensitive resin on the surface of the semiconductor substrate;

a via hole forming process of grinding the reverse side of the semiconductor substrate until the hole to be the via hole appears and forming the via hole;

a reverse side electrode forming process of forming a reverse side electrode on the semiconductor substrate; and

a laying process of dividing the semiconductor substrate chip by chip and laying the divided semiconductor substrate on the substrate for assembly via an adhesive metal.

8. The manufacturing method of the semiconductor according to Claim 7,

wherein the semiconductor substrate is rotated at 200 ~ 900 rpm in the photosensitive resin filling process, and

the semiconductor substrate is rotated in order that a film thickness of the surface of the photosensitive resin becomes 4 ~ 10  $\mu\text{m}$  in the photosensitive resin flattening process.

9. The manufacturing method of the semiconductor according to

Claim 8,

wherein a photosensitive resin whose main ingredient is silicone resin or epoxy resin is applied in the photosensitive resin filling process.

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10. The manufacturing method of the semiconductor according to Claim 9,

wherein a photosensitive resin whose viscosity at 25°C is 70~600 m Pa · s is applied in the photosensitive resin filling process.

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11. The manufacturing method of the semiconductor according to Claim 10,

wherein a reverse side electrode made of laminated metals, Cr and Au, is formed in the reverse side electrode forming process.

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12. The manufacturing method of the semiconductor according to Claim 11,

wherein the adhesive metal is either Ag paste or AuSn paste, and

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chips are laid on the substrate for assembly via either Ag paste or AuSn paste in the laying process.

13. The manufacturing method of the semiconductor according to Claim 8,

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wherein the adhesive metal is either Ag paste or AuSn paste, and

chips are laid on the substrate for assembly via either Ag paste or AuSn paste in the laying process.

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14. The manufacturing method of the semiconductor according to Claim 7,

wherein a photosensitive resin whose main ingredient is

silicone resin or epoxy resin is applied in the photosensitive resin filling process.

15. The manufacturing method of the semiconductor according to  
5 Claim 7,

wherein a photosensitive resin whose viscosity at 25°C is 70~600 m Pa · s is applied in the photosensitive resin filling process.

16. The manufacturing method of the semiconductor according to  
10 Claim 7,

wherein a reverse side electrode made of laminated metals, Cr and Au, is formed in the reverse side electrode forming process.